

Dead Bird Surveillance

Dead Bird Surveillance Highlights for 2005

- 1,071 dead birds were reported to Health Line Peel – a decrease of 48% from 2004 and the lowest number since 2002
- Approximately 60% of the dead birds were reported from the City of Mississauga, 30% from the City of Brampton and 10% from the Town of Caledon
- The number of target birds (crows, blue jays) reported increased by 40% over 2004 – most were from the City of Mississauga. (In 2004, most of the target birds were from the Town of Caledon)
- The first positive bird was observed in late July - the first time a positive bird finding preceded positive mosquitoes
- 44% of birds tested were positive for WNV
 - 18 positive birds in Mississauga (16 in South Mississauga)
 - 10 positive birds in Brampton
 - 5 positive birds in Caledon
- Ward 2 in Mississauga and Ward 1 in Brampton had the highest densities of bird sightings per square kilometre
- There was a 20% increase in WNV positive birds in Ontario (from 250 to 300)
- Across Ontario, Peel Region had the second highest number of WNV positive birds (33); only Toronto had more (37); however, Peel Region ranked 6th in the percentage of birds testing positive
- Nationally, the number of dead birds increased by approximately 7% - Ontario and Quebec had the highest percentage of birds testing positive for WNV (23 and 21%) compared to the national average of 11%.
- All seven Great Lakes States reported WNV positive birds with New York State reporting the most at 252.

Historically, the sudden appearance of dead birds has been the first indicator of the presence of WNV in an area. The corvid species (crows, blue jays and hawks) are particularly sensitive to the effects of WNV and are the most likely to die once infected. For this reason, the Region of Peel maintains a Dead Bird Surveillance program.

Telephone calls reporting dead birds are received by Peel Public Health and a dead bird surveillance form is completed for every call. Dead bird surveillance started in 2002 with the inclusion of only crows but has since changed to include blue jays. Hawks were included for testing in 2004 for study purposes only. Testing of dead birds for WNV is conducted by the

Canadian Cooperative Wildlife Health Centre (CCWHC) located in Guelph, Ontario. Not every target bird is suitable for testing due its physical condition. Also, towards the end of the WNV season the CCWHC will only accept a fixed number of birds in a given week for WNV testing. Therefore, not every dead target bird reported in season is tested.



Figure 3 American Crow

(Source: Canadian Cooperative Wildlife Health Centre, 2004)

In 2006, a private pest control company was contracted to pick up dead crows and blue jays birds for testing. In previous years local animal control provided the dead bird pick up service.

Reports of other species of dead birds are noted and mapped but Peel Public Health does not collect or test these birds for WNV.

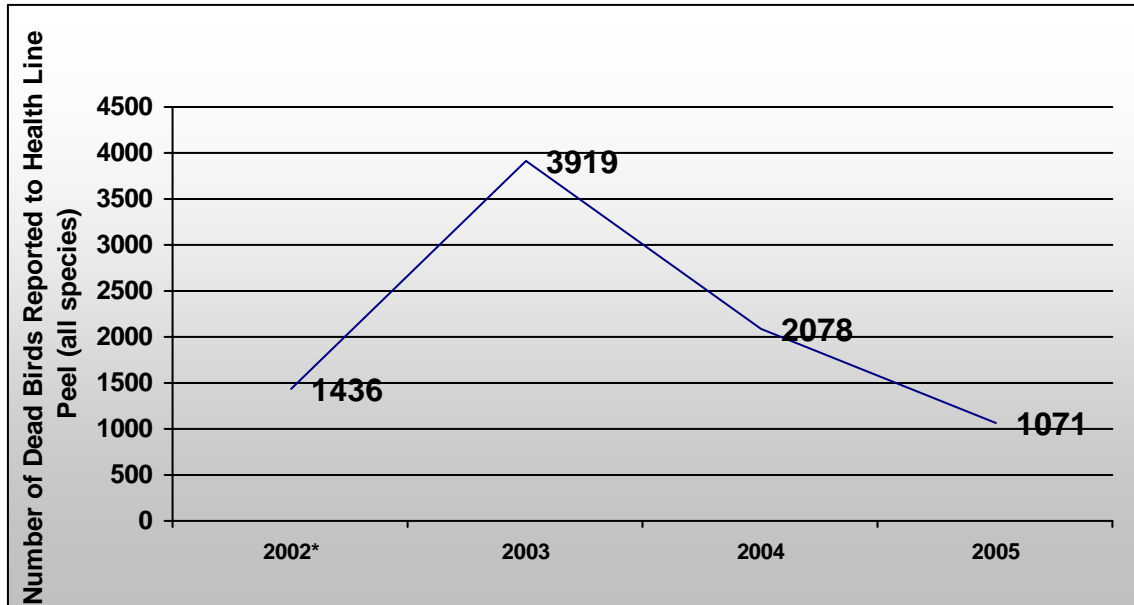
As shown in Figure 5, the total numbers of dead birds (all species) reported in 2005 were the fewest since the start of the Peel Region bird surveillance program in 2002. There were 1,071 dead bird calls were received by Health Line Peel in 2005. This represents a 48% and 73% decline in dead bird reports from 2004 and 2003, respectively. This decline in the number of reports can be due to a number of factors including a general population decline of birds, especially those species sensitive to WNV that may have been significantly impacted in previous years. It is not related to a decline in mosquito vector population since the number of mosquitoes collected increased by 41% over the previous year (refer to section on adult mosquito surveillance). As noted later on in this section, there are no reports that authoritatively document a widespread population decline in sensitive bird species due largely to the lack of regular, systematic assessment of bird populations.



Figure 4 Blue Jay

(Source: Canadian Cooperative Wildlife Health Centre, 2004)

Figure 5 Number of Dead Birds Reported to Health Line Peel, Region of Peel, 2002-2005



*In 2002 all dead bird reports are assumed to be crows.

Map 3 illustrates the geographic location for all species of dead birds reported to Health Line Peel in 2005 across Peel Region. Mississauga reported approximately 60% of the dead birds in the Region of Peel. The majority were found in locations south of Highway 401 with a small cluster in the northeast community of Malton. Almost 30% of the dead birds were from Brampton, most from central Brampton. Approximately 10% of the dead bird reports were from Caledon where a greater dispersion of dead bird reports across the municipality was observed, with a small cluster in Bolton. This small clustering effect may reflect the fact that there is a greater population density in Bolton and therefore more opportunity to notice and report dead birds.

Table 5 presents the number of dead bird reports for the target species, crows and blue jays over the four-year period 2002 to 2005. There were 1,436 dead crows reported in 2002 in comparison to 154 dead crows and blue jays combined, in 2005. Eighty-seven of the 154 were crows and 67 were blue jays. This represents an increase of approximately 40% over the previous year. Comparisons with 2002 and 2003 can only be conducted using the dead crow data. There was a significant decrease in dead crows from 1,436 in 2002 and 150 in 2003 to 87 in 2005. When separating the reports based on the local municipality almost half of the reports (72) were found in Mississauga (47%). Brampton and Caledon each had 41 reports of dead target birds. This differs from the previous year when the greatest percentage, 53%, of the target birds were from Caledon.

Table 5 **Number of Dead Bird Reports for Target Species by Municipality - Region of Peel, 2002-2005**

	2002 ¹	2003 ¹	2004 ²	2005 ²
Brampton	485	37	25	41
Caledon	48	54	58	41
Mississauga	903	59	27	72
TOTAL	1,436	150	110	154

¹Target birds were crows only

²Target birds were crows and blue jays

Source: Region of Peel, 2004

Figure 6 illustrates the temporal trend for dead target birds for each year of the program. As noted previously, the greatest die off of birds, specifically crows was seen in 2002. In that year, the number of target birds being reported was significantly greater than other years. The increase started in July and continued with high numbers throughout September. In one week there were close to 250 reports.

Map 3 West Nile Virus - Bird Surveillance (All Birds),
Region of Peel, 2005 (Week 19-39)

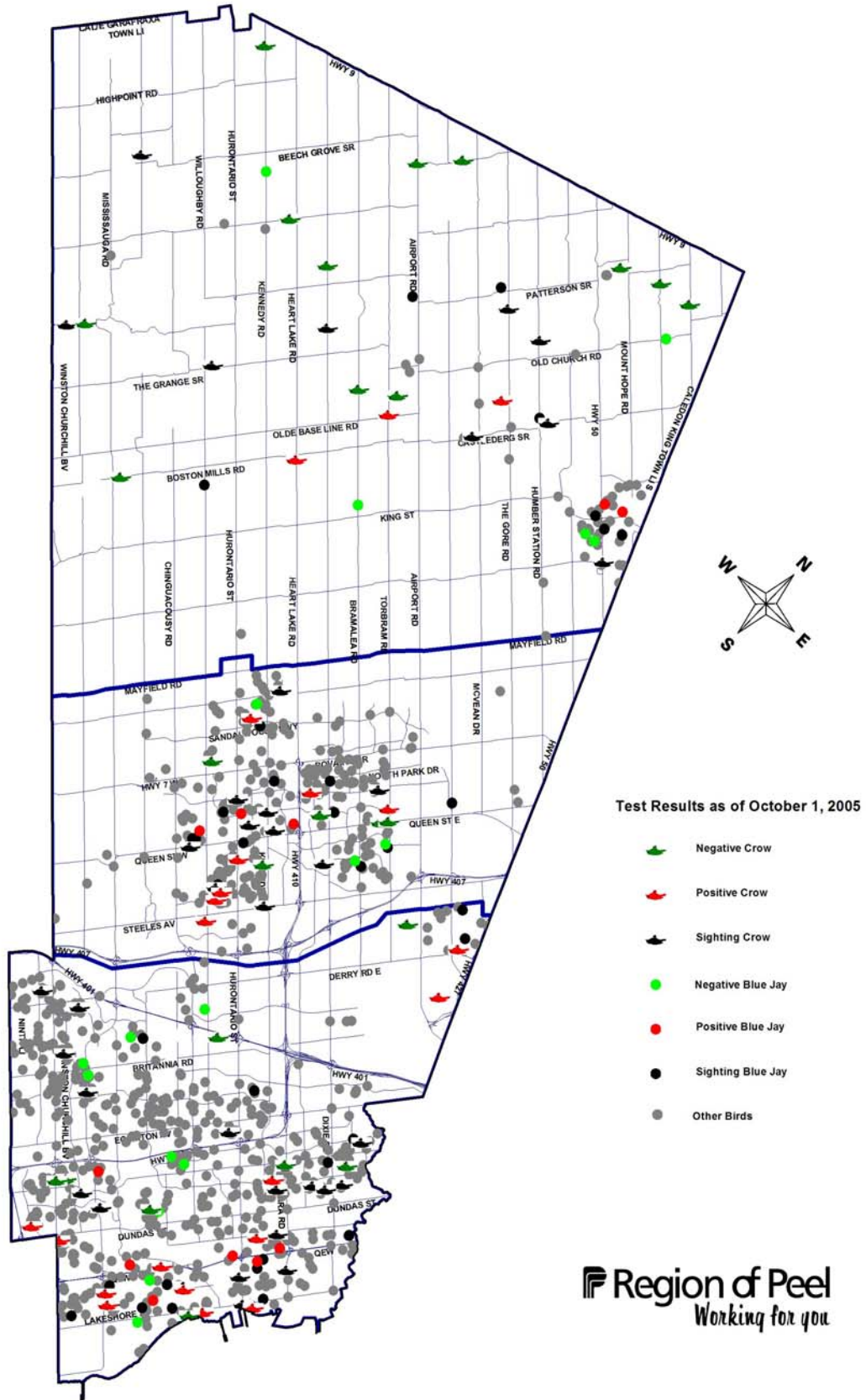


Figure 6 Total Target Birds by Week* - Region of Peel, 2002-2005

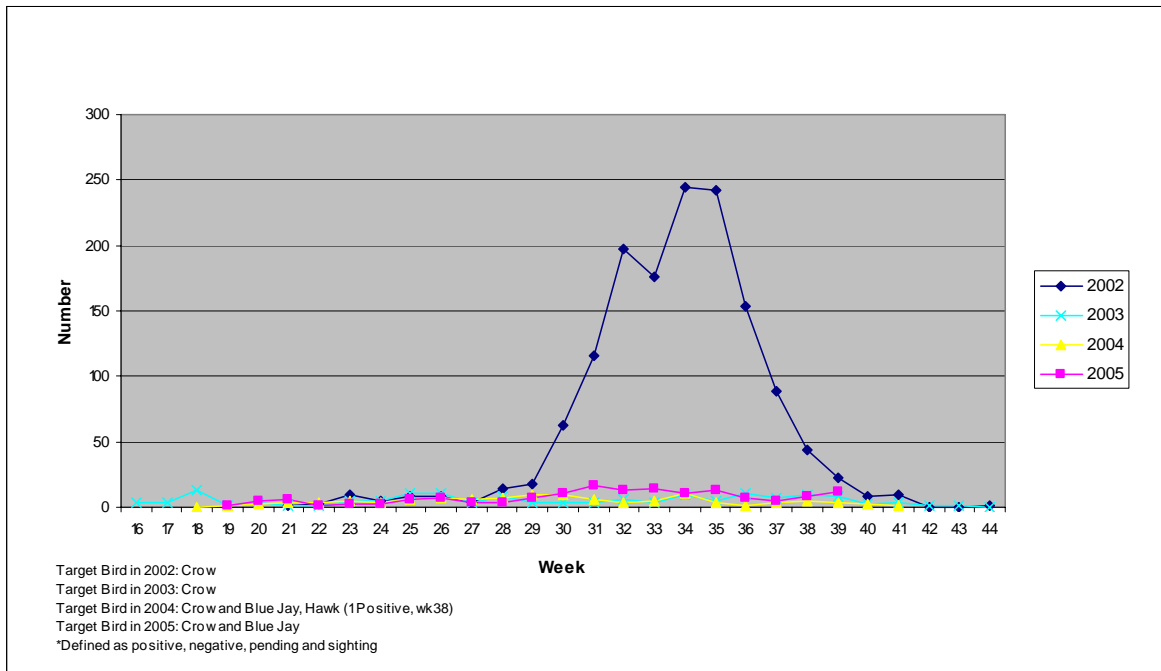
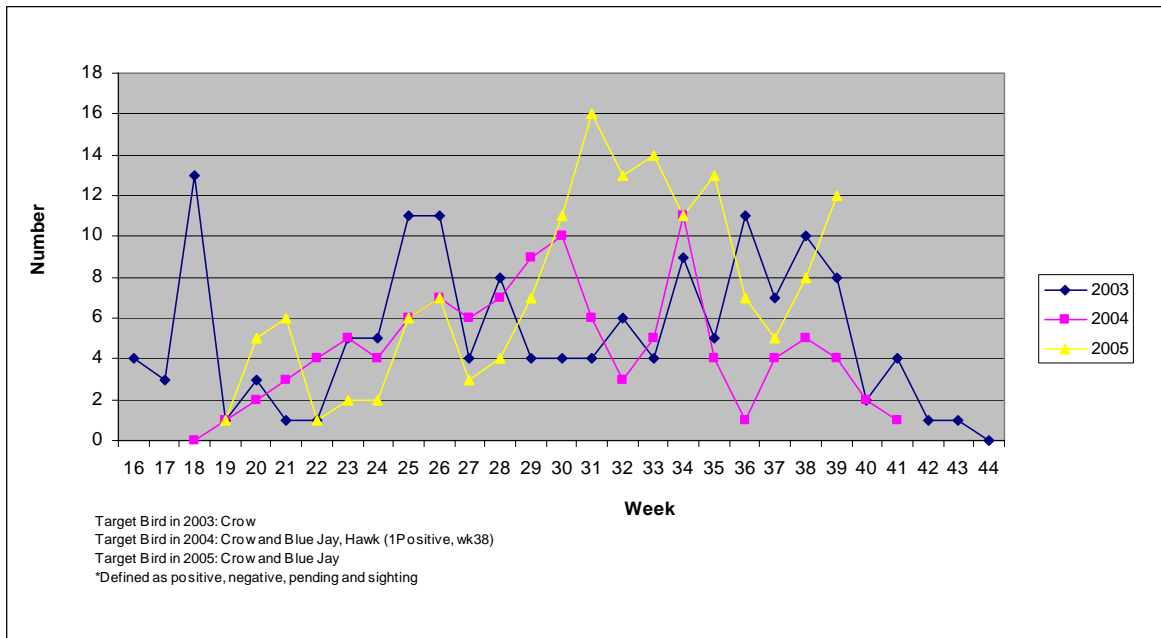


Figure 7 illustrates the 2003, 2004 and 2005 temporal trends (2002 excluded). The patterns of target bird reports amongst these three years are similar, whereby the first reports start in early May and continue steadily throughout the season. In these years, the number of dead birds reported weekly remained below 10 birds most weeks with the highest absolute number occurring in 2005 during week 31. During this week, 16 target birds were reported.

Figure 7 Total Target Birds by Week* - Region of Peel, 2003-2005



2005 – West Nile Virus in the Region of Peel

The weekly trend of target bird reports over the last two years is fairly consistent whereby the numbers are higher in the last week of July and throughout August. This is only slightly different from 2003 where peaks were seen earlier in June and later in September. The weekly dead bird reports were consistently greater than 10, peaking in week 31 at 16 birds.

As noted in Table 6, the first WNV positive bird in the 2005 surveillance season was reported in week 30 (July 24, 2005) in the City of Mississauga. The timing of the first positive bird occurred a bit later than the first positive finding in the previous two years. As noted in section on adult mosquito surveillance, the first positive mosquitoes were found in week 27 (July 7, 2005), three weeks prior to the first positive bird. 2005 was the first year that positive mosquitoes preceded the first positive bird. In 2002, WNV positive birds were observed as early as mid-May.

Table 6 Date and Location of First Positive Target Bird (Crow or Blue Jay) - Region of Peel, 2001-2005

Year	Date	Location
2001	August 10, 2001	Mississauga
2002	May 19, 2002 (week 21)	Mississauga
2003	July 4, 2003 (week 27)	Caledon
2004	July 6, 2004 (week 27)	Brampton
2005	July 24, 2005 (week 30)	Mississauga

In 2005, the total number of WNV positive birds in the Region of Peel was 33. There were 10 positives in Brampton, five in Caledon and 18 in Mississauga. Of the 33 WNV positive birds, 22 were crows and 11 were blue jays.

Table 7 shows an apparent increase in the number of WNV positive birds in 2005 when compared to previous years. However, this may not be a true measure of the rate of WNV infection in birds because the number of birds accepted for viral testing in a given week is capped towards the end of the season. This maximum was not applied consistently across all four years and therefore comparisons from year to year should be made with caution.

Table 7 Annual Comparison of the Total Number of WNV Positive Birds - Region of Peel, 2002-2005

Year	# of birds tested	# of positive birds	Per cent positive
2002	71	20	28.2
2003	58	12	20.7
2004	60	16	26.7
2005	75	33	44.0

Sources: CCWHC – last update 2005-11-15 (CCWHC, 2005); Region of Peel, 2004; Region of Peel, 2003; Region of Peel, 2002

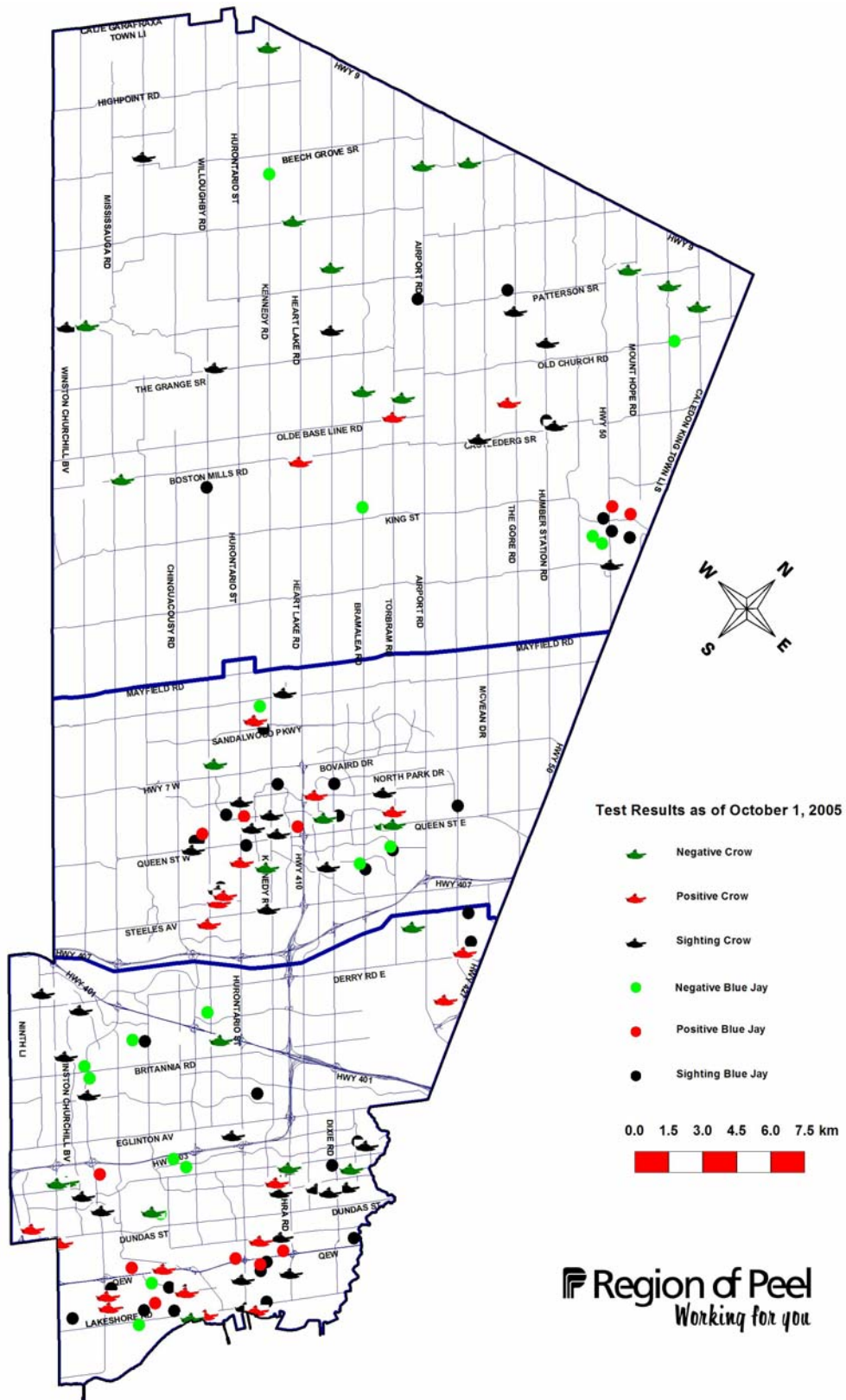
Map 4 illustrates the geographical distribution of the target birds and their viral status (positive, negative and sighting). In Mississauga, reports of dead crows and blue jays were distributed across the City. However, the positive birds reported in Mississauga were predominantly found in south Mississauga -16 out of 18 WNV positive birds found in Mississauga¹. This observation is consistent with what has been seen in previous years. It forms the basis for the stratified analysis and informs the annual prevention and control plan. In the interest of circumscribing the geographical area even further, 12 of the 16 positive birds in south Mississauga were found in locations south of the Queensway East and West.

Dead bird reports in Brampton tended to cluster mostly around the centre of Brampton. In Caledon, dead bird reports were dispersed throughout the town. There was a small clustering of blue jay reports located in Bolton.

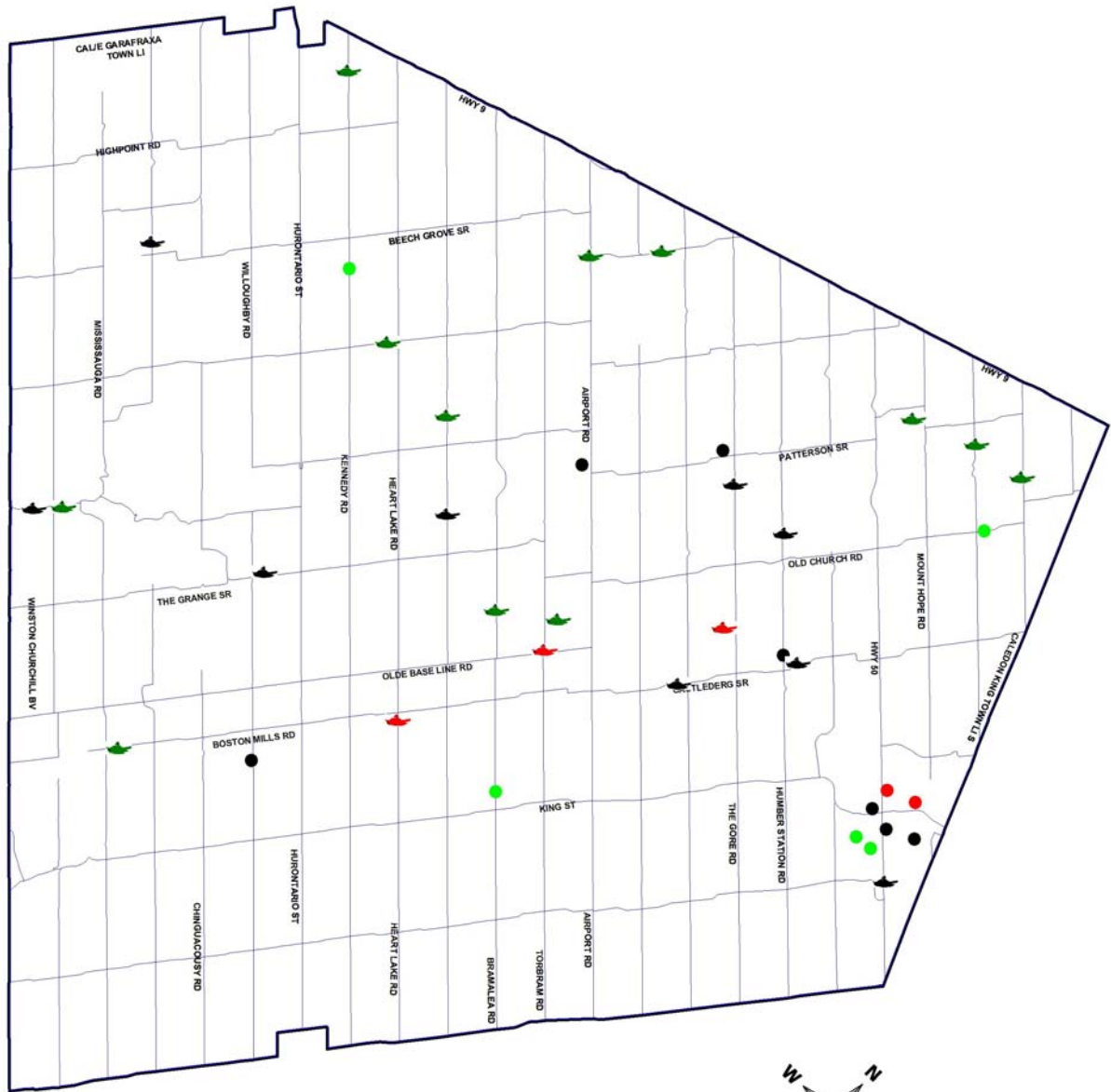
Map 5, 6, and 7 present the data for each of the three local municipalities.

¹ Highway 403 is the dividing line between North and South Mississauga

Map 4 West Nile Virus - Bird Surveillance (Crows & Blue Jays), Region of Peel - 2005 (weeks 19-39)



Map 5 West Nile Virus - Bird Surveillance (Crows & Blue Jays), Caledon, 2005 (Weeks 19-39)



Test Results as of October 1, 2005

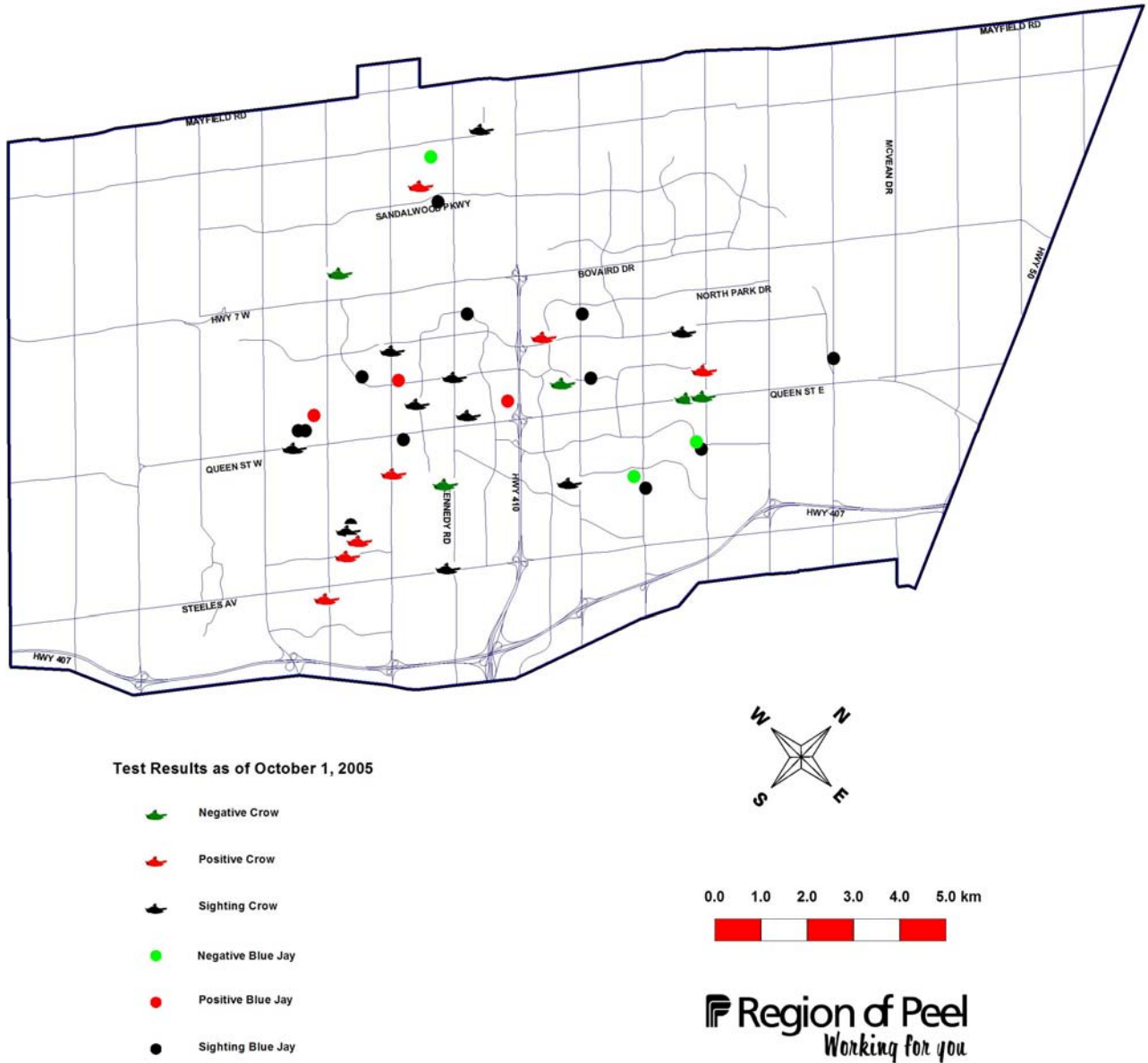
-  Negative Crow
-  Positive Crow
-  Sighting Crow
-  Negative Blue Jay
-  Positive Blue Jay
-  Sighting Blue Jay

0.0 1.0 2.0 3.0 4.0 5.0 km

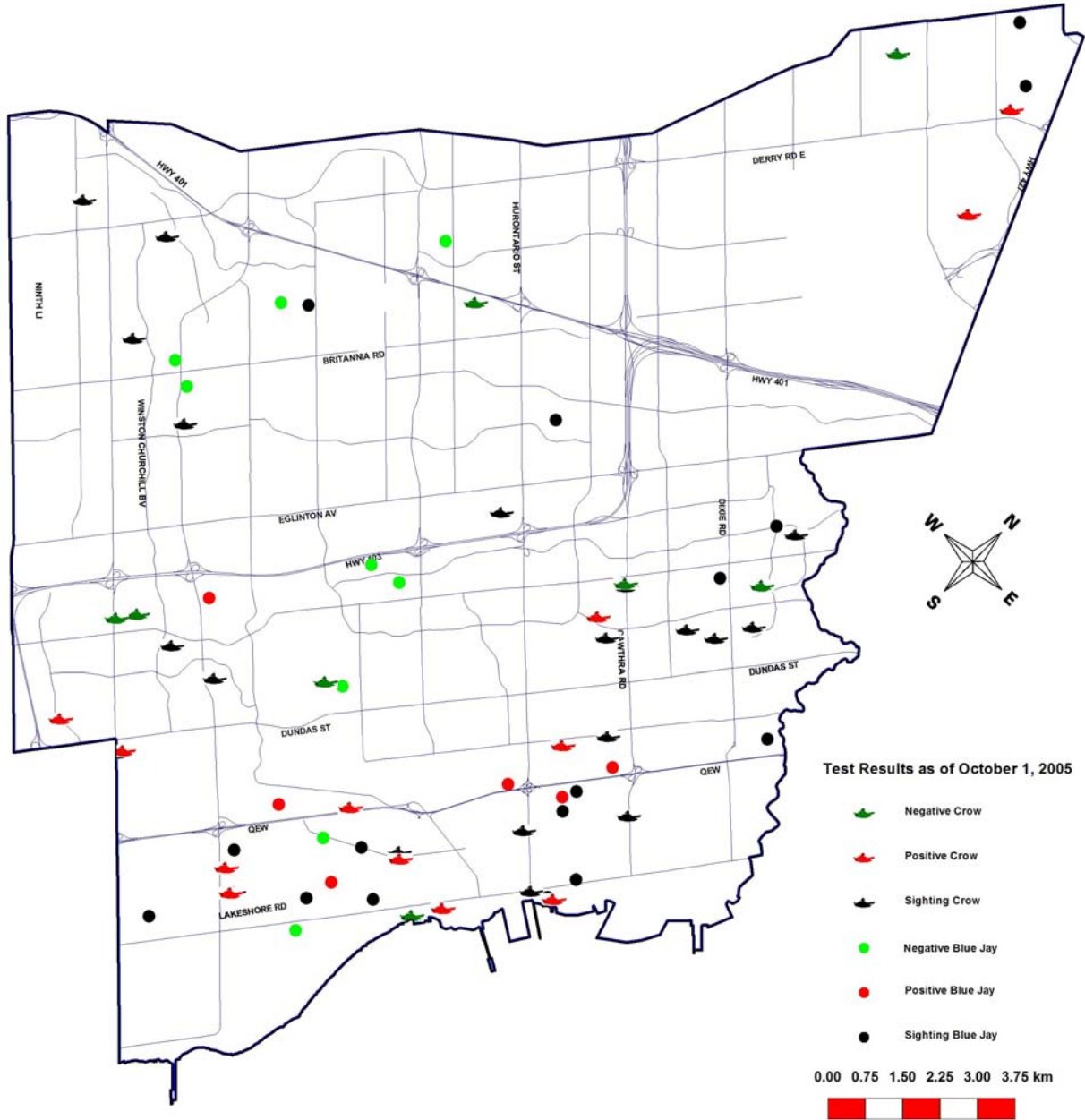


Region of Peel
Working for you

Map 6 West Nile Virus - Bird Surveillance (Crows & Blue Jays), Brampton, 2005 (Weeks 19-39)



Map 7 West Nile Virus - Bird Surveillance (Crows & Blue Jays), Mississauga, 2005 (Weeks 19-39)



Dead bird reports across the Region of Peel were mapped by ward (Map 8). This allows for a density analysis of the number of target bird sightings (positives) per square kilometre. Ward 2 in Mississauga and Ward 1 in Brampton had the highest densities, with 0.658 to 0.818 per square kilometre, respectively. Ward 5 in Caledon had the highest density in this municipality but was about half of that observed in Wards 2 and 1 in Mississauga and Brampton.

Bird Surveillance in other Ontario Health Units

Table 8 presents the data collected by the CCWHC on the birds tested and those that were positive for WNV in each Ontario health unit. There was a 20% increase in the total number of birds positive for WNV in Ontario - 250 positive birds in 2004 compared to 300 in 2005. Peel Region had the greatest number of birds tested (75) and was second only to the City of Toronto in the number of birds testing positive for WNV (33 compared to 37, respectively).

Table 8 also presents the ratio of birds testing positive to the total number of birds tested. The average positive rate across Ontario was 23% (range 0% to 80%). In 2005, the highest positive bird rate, 80%, was observed in Windsor-Essex County. Peel Region ranked sixth in Ontario with a 44% positive rate and third when comparing only to adjacent municipalities - City of Toronto, Simcoe County, York Region, Halton Region and the Region of Wellington-Dufferin-Guelph. The two adjacent municipalities ranking higher than the Region of Peel were the City of Toronto at 62% and the Region of Halton at 49%.

Map 8 Density of Dead Crow & Blue Jay Sightings by Peel Ward, Region of Peel, 2005

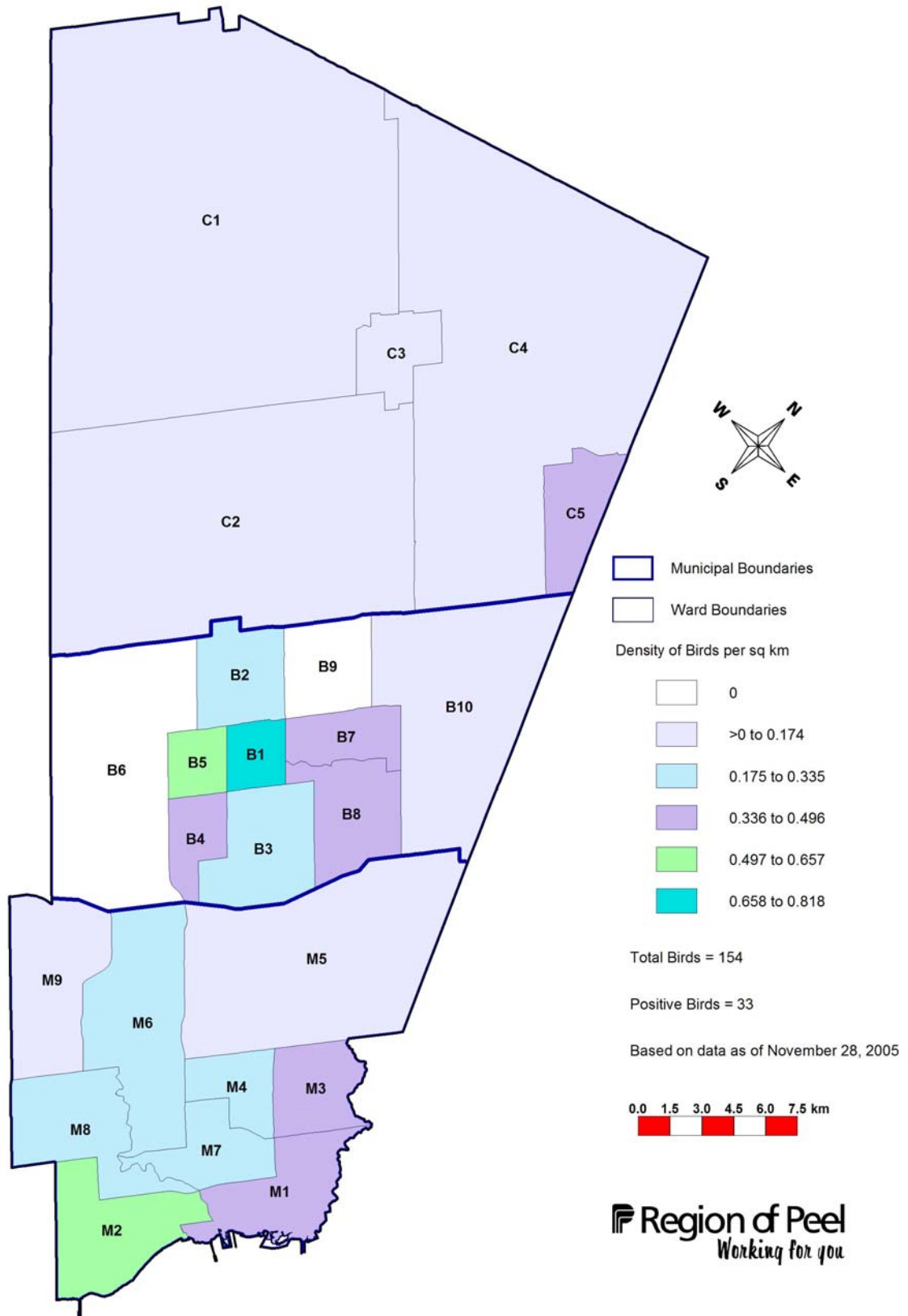


Table 8 Dead Bird Results by Ontario Health Unit - Ontario, 2005

Health Unit	Total Submitted	Not Tested	Tested	Total Positive	Per Cent Positive
Algoma	34	0	34	5	14.7
Brant	35	0	35	11	31.4
Chatham – Kent	12	0	12	9	75.0
Durham	70	1	69	8	11.6
Eastern Ontario	16	0	16	2	12.5
Elgin - St.Thomas	8	0	8	2	25.0
Grey - Bruce - Owen Sound	35	0	35	2	5.7
Haldimand - Norfolk	10	1	9	1	11.1
Haliburton - Kawartha	44	0	44	3	6.8
Halton	41	0	41	20	48.7
Hamilton - Wentworth	57	7	50	15	30.0
Hastings - Prince Edward	50	3	47	3	6.3
Huron County	10	0	10	4	40.0
Kingston, Frontenac	32	0	32	4	12.5
Lambton	16	0	16	8	50.0
Leeds, Grenville, Lanark	18	0	18	1	5.6
Middlesex - London	19	0	19	6	31.6
Niagara Region	25	2	23	5	21.7
North Bay	43	0	43	2	4.7
Northwestern	48	2	46	7	15.2
Ottawa - Carleton	53	2	51	6	11.8
Oxford County	30	0	30	8	26.7
Peel Regional	80	5	75	33	44.0
Perth District	12	0	12	5	41.7
Peterborough	63	0	63	22	34.9
Porcupine	41	2	39	0	0
Renfrew District	29	0	29	1	3.4
Simcoe County	55	0	55	7	12.7
Sudbury	53	0	53	2	3.8
Thunder Cay	52	0	52	10	19.2
Timiskaming	19	2	17	2	11.8
Toronto	61	1	60	37	61.7
Waterloo	36	1	35	11	31.4
Wellington - Dufferin – Guelph	45	2	43	4	9.3
Windsor - Essex County	15	0	15	12	80.0
York Regional	61	7	54	22	40.7
TOTAL	1,328	38	1,290	300	23.3

Red - highest per cent positive rate

Yellow - health units adjacent to the Region of Peel

Blue - Region of Peel

CCWHC last update 2005-11-15

Source: adapted from <http://wildlife1.usask.ca/ccwhc2003/portal/provReports.php>

Bird Surveillance across Canada

Table 9 presents the dead bird data from the Canadian provinces and territories. A total of 4,148 birds were submitted for testing in 11 provinces and territories. Only Nunavut and the Yukon did not submit any dead birds for testing. Approximately 11% (n = 447) of all the birds submitted across Canada tested positive for WNV. This is an increase of approximately 7% over the previous year¹¹.

Ontario, British Columbia and Quebec submitted the greatest number of birds with 1,328, 1,120 and 554 birds, respectively. Approximately 23% of the birds from Ontario and 21% from Quebec were positive for WNV. There were no positive birds submitted from British Columbia. Other provinces with positive birds were Saskatchewan, Alberta, and Manitoba with the rate of positive birds at or below the national rate of almost 11%.

Table 9 Dead Bird Results by Province - Canada, 2005

Province	Total Submitted	# not Tested	Total Positive	Per cent Positive
AB	215	0	6	2.8
BC	1,120	58	0	0.0
MB	174	13	12	6.9
NB	259	3	0	0.0
NL	73	10	0	0.0
NS	202	2	0	0.0
NT	7	0	0	0.0
ON	1,328	38	300	22.6
PE	86	5	0	0.0
QC	554	22	115	20.8
SK	130	9	14	10.8
TOTAL	4,148	160	447	10.8

CCWHC Last update 2005-11-18

Source: adapted from <http://wildlife1/usask.ca/ccwhc2003/portal/provReports.php>

Bird Surveillance in Great Lakes States

Table 10 presents the numbers of positive birds reported for each of the Great Lakes States¹². In 2005, bird surveillance programs in all seven Great Lakes States reported WNV positive birds. New York had the greatest number of positive birds (252). It was followed by Illinois with 225 whereas Pennsylvania had the fewest at 23. All the Great Lakes States had fewer numbers of WNV positive birds when compared to the province of Ontario. Ontario had 300 WNV positive birds in 2005 compared with Illinois and New York State which had 225 and

252 positive birds, respectively. It is not known if the United States had a maximum number of birds allowed for testing in any given week but Ontario Health Units were limited to a maximum number of four per week.

Table 10 Great Lakes States - Number of WNV Positive Birds - United States, 2005

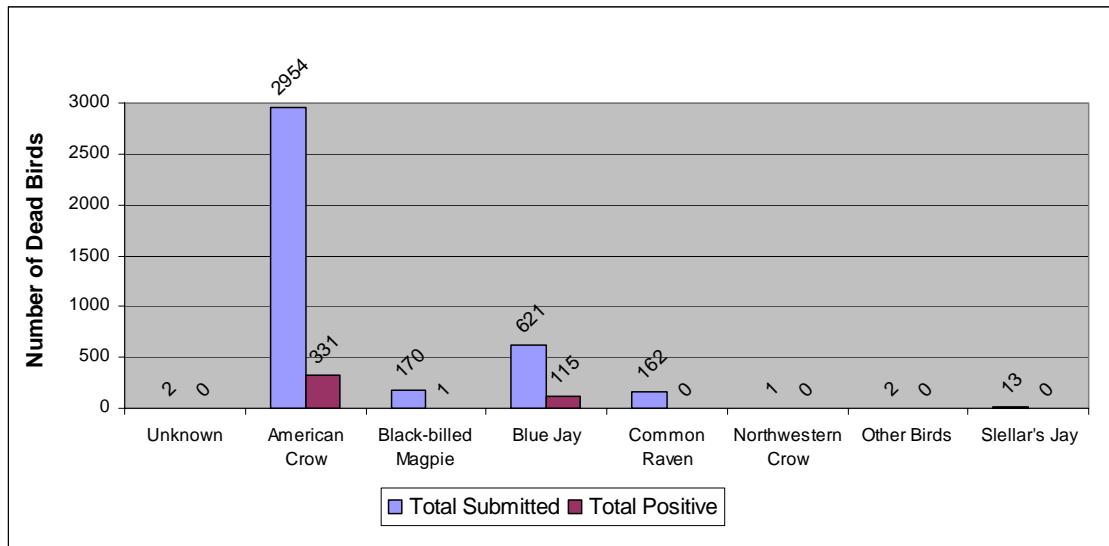
Great Lakes State	# of WNV positive birds reported
Illinois	225
Indiana	51
Minnesota	93
New York	252
Ohio	73
Pennsylvania	23
Wisconsin	47

Source: USGS, November 23, 2005

Other Bird Species

Corvid birds are particularly sensitive to WNV. The CCWHC tests many species including crows and blue jays. Figure 8 illustrates the various species tested and number of positive birds across Canada organized by species. Three hundred and thirty-one American Crows, 115 Blue Jays and one Black-billed Magpie were the only species that tested positive for WNV in Canada in 2005. One hundred and sixty-two Common Ravens were submitted for testing but none were positive for WNV.

Figure 8 Dead Bird Reports by Species - Canada, 2005



2005 – West Nile Virus in the Region of Peel

When evaluated temporally throughout the surveillance season (May through October), American Crows were the first and last specimens to be submitted in 2005 (Figure 9). This same pattern was observed in 2004 (Figure 10). There was also a 37% decline in the total number of birds submitted to CCHWC in 2005 compared to 2004. The number of American Crows submitted declined by a similar rate, 36%; however, the decline in Blue Jay species was less at 29% compared to 2004¹³.

While the overall numbers of birds submitted for WNV testing is declining, there is no authoritative reference that supports a population decline in certain bird species. The annual Christmas Bird Count (CBC) is a non-scientific count of various bird species conducted by volunteers around the world and has reported a decline in some local bird populations; however, the evidence to suggest a continent-wide decline is lacking¹⁴. Also, it is difficult to assess the impact of the fluctuations in the numbers of volunteers on the population counts for specific species. For example, the CBC American Crow data for Ontario shows a decline over the last three years. However, over the same time period the number of volunteers participating in the CBC declined as well¹⁵.

Figure 9 Bird Species Submitted based on the Week of the Year – Canada, 2005

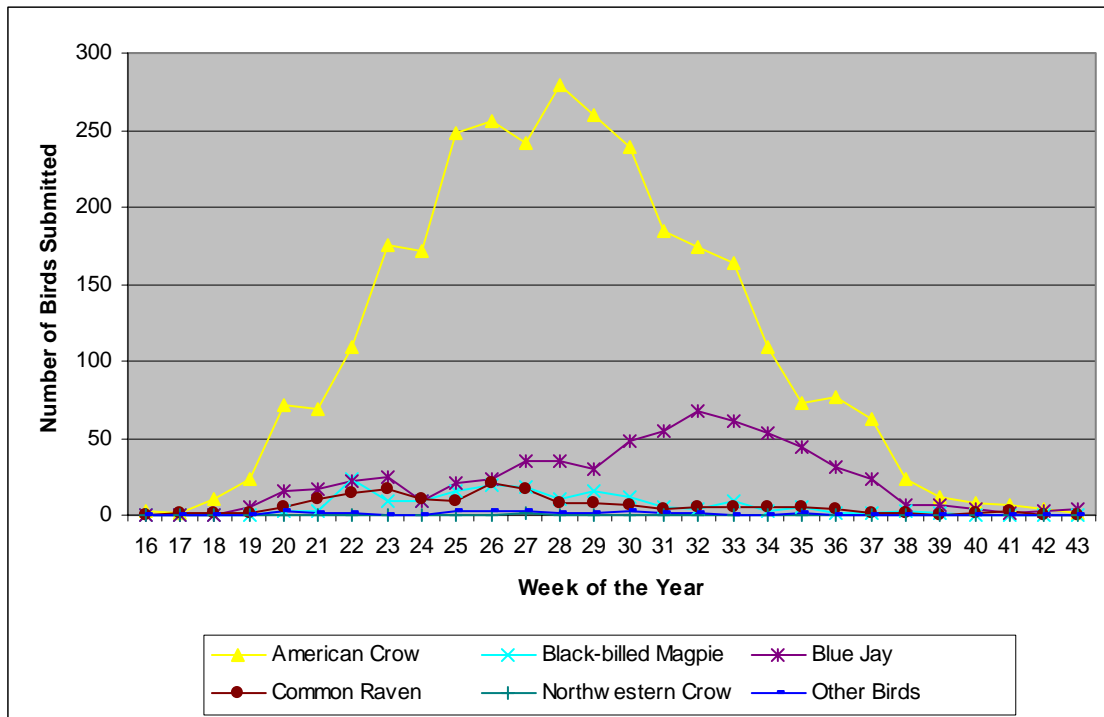


Figure 10 Bird Species Submitted based on the Week of the Year - Canada, 2004

